

PATENT ABSTRACTS OF JAPAN

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(54) MATERIAL PACKED WITH AGROCHEMICAL

(57)Abstract:

PURPOSE: To obtain a simply producible fumigant of agrochemical capable of readily and hygienically controlling harmful organisms in soil.

CONSTITUTION: This material packed with agrochemical is preserved in a liquid and is obtained by wrapping a fumigant in a liquid state as it is to control harmful organisms in a gas in a film having high barrier properties and characteristics of losing barrier properties by coming into contact with water. The material packed with agrochemical is simply and hygienically handleable without impairing controlling effect and without feeling irritation and is readily producible.

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CLAIMS

[Claim(s)]

[Claim 1] The agricultural-chemicals package object characterized by packing with the film which has ***** and high gas barrier property according the agricultural-chemicals active ingredient which has ordinary temperature vaporization nature to water [claim 2] The agricultural-chemicals package object [claim 3] of claim 1 which divided and connoted the agricultural-chemicals active ingredient which has ordinary temperature vaporization nature Claim 1, the agricultural-chemicals package object [claim 4] of two publications whose agricultural-chemicals active ingredient which has ordinary temperature vaporization nature is chloropicrin The agricultural-chemicals package object according to claim 1 to 3 which is the film made from polyvinyl alcohol with which the film which has ***** and high gas barrier property uses paper or a nonwoven fabric

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] It has the property (it is described as *****) for the amniorrhesis or a pinhole to be able to do the agricultural-chemicals active ingredient which has vaporization nature in ordinary temperature with a steam, the moisture in waterdrop or soil, etc. as for this invention, and to lose gas barrier property. And it is related with the agricultural-chemicals package object packed with the film which has high gas barrier property. the fumigant (drugs for agriculture which save with a liquid and demonstrate the prevention effect of a noxious organism by the gas) used in order to prevent the noxious organism on agriculture — more — insurance — and it can be used simple and enables it to manufacture more simply

[0002]

[Description of the Prior Art] In order to prevent the noxious organism which does damage to agricultural products, many fumigants for soil sterilization, such as chloropicrin, a methyl bromide, and a D-D agent, are used from the former. These drugs plow, in case they level, they pour in and use a field for soil, but in order to stop that an active ingredient escapes, to heighten effect or to control an irritating odor in atmospheric air, it is common to sprinkle and carry out water seal from it, or to cover with the film for agriculture. Since these drugs have high vaporization nature, there is a unique irritating odor or toxicity is strong, even if it uses for fitness, displeasure is given to neither a user nor the residents around a processing field, or a failure on health may be done depending on a situation. moreover, since it will not become about prudence if there is no term **, it is complicated that a special processing special-purpose machine must be prepared etc. In order to solve these problems, the approach of packing a fumigant with a water soluble film and using it simple is introduced from before. However, when the fumigant was packed with the water soluble film with the liquid, for the leakage or cone reason, the fumigant was not put in practical use from the pinhole or the heat-sealing section of a film. In order to solve them, it tabletizes using a gelling agent and the approach of packing with a water soluble film is indicated by JP,47-1799,B, JP,47-1800,B, JP,62-192301,A, JP,63-230602,A, etc. However, the jelly-like object or solid obtained by these approaches is soft, and since there is no reinforcement, it has the fault which returns to a liquid by vibration under transportation etc., or collapses. It is better to be able to manufacture that manufacturing method by easy formula as much as possible without, using various additives, such as a gelling agent and a gel strength reinforcing agent, if possible since the active ingredient which is easy to gasify may cause stimulative and a toxic problem, although the approach of adding synthetic rubber and a cellulosic and maintaining gel strength is indicated in order to compensate this fault. moreover, although the approach of carrying out a vacuum packing is indicated in order to leak outside or to prevent oxidizing by the oxygen in air, in case it packs to a water soluble film (JP,62-192301,A), when making it a vacuum, there is a possibility that a part of gas active ingredient may flow out, and it is not made a vacuum — also coming out — it is better to make it satisfactory formulation. Although the approach (JP,56-45401,A) of making a fumigant stick to an adsorbent and on the other hand containing in a water-soluble-resin container is also indicated, it has not resulted in utilization for economical efficiency etc.

[0003]

[Problem(s) to be Solved by the Invention] it be the technical problem of this patent to make it the drugs gestalt which can be easily manufacture to low cost without perform complicated gestalten , actuation , etc. , such as solidification using a gelling agent , an oil absorption agent , synthetic rubber , an inflammable organic solvent , inflammable various additives , etc. for the active ingredient for soil sterilization which be easy to gasify , and vacuum packing , to be able to use it simple [a user] and sanitarily , and to enable it to fully demonstrate the effect of active ingredient original moreover .

[0004]

[Means for Solving the Problem] this invention persons result in this invention, as a result of studying wholeheartedly the technique on which a technical problem which was described above is satisfied. Namely, an agricultural-chemicals active ingredient to save this invention with a liquid, make it a gas, and prevent the noxious organism in soil Manufacture more simply (it is hereafter described as this agricultural-chemicals active ingredient), and it is related with the drugs gestalt the user enabled it to use simple. It is related with the package object characterized by packing with the high gas barrier property film (it being hereafter described as this package film) which has ***** while it has been liquefied, without solidifying this agricultural-chemicals active ingredient using a gelling agent etc. If this package object processes the specified quantity at intervals of predetermined in soil front faces, such as a field, or soil and it covers with a sheet etc. if needed (indispensable especially in the case of soil

surface treatment), the noxious organism in soil can be prevented simpler than douche processing of habitual liquids and solutions and sanitarily. That is, a hole can open [this the package film] the processed package object by the steam, waterdrop, etc., and it can prevent a noxious organism by emitting this agricultural-chemicals active ingredient of contents, and being spread in soil in a gas. This invention is explained concretely below. This agricultural-chemicals active ingredient that can be used for this invention lives the life span or one time into soil, it has the activity which prevents the insect which does damage to useful plants, such as agricultural products, weeds, disease, etc., and D-D (mixture of 1,3-dichloropropene and 1,2-dichloropropane), DBCP (1, 2-dibromo-3-3 chloropropane), DCIP (dichloro diisopropyl ether), MITC (methylisothiocyanate), chloropicrin (trichloronitromethane), a methyl bromide (bromomethane), dimethyl dichloro vinyl HOFETO, etc. are mentioned. However, the agricultural-chemicals active ingredient used by this invention is not limited above, can be saved with a liquid, if it shows prevention activity to a noxious organism by the gas, it corresponds altogether, and it may use together and use one kind or two kinds or more.

[0005] The process of the agricultural-chemicals package object of this invention may dissolve and use adjuvants, such as a necessary minimum organic solvent for demonstrating the features as a fumigant efficiently, without spoiling that activity, a surfactant, and a stabilizing agent, for this agricultural-chemicals active ingredient, and an agricultural-chemicals pharmaceutical preparation package object can be easily acquired by packing this agricultural-chemicals constituent (it being hereafter described as this agricultural-chemicals constituent) with this package film, while it has been liquefied. Moreover, since it can prevent that the drugs which could prevent the deviation of the contents within a package and were processed on the soil front face by dividing one package object in the shape of a cel with heat sealing etc. localize with a surface inclination and irregularity when packing drugs several g or more in this invention, it is advantageous. The drugs of such a gestalt fit the agricultural-chemicals active ingredient which vaporizes gas with especially stimulative [, such as chloropicrin,].

[0006] Although this package film that can be used by this invention does not necessarily need to melt into water, ***** is required for it and should just choose it according to that this agricultural-chemicals constituent of endocyst is liquefied or the property of this agricultural-chemicals constituent that is good anything and is put into inside if it is a film with the fixed reinforcement which does not penetrate by the gas or does not melt into this agricultural-chemicals constituent, preservation, or the situation to be used during preservation. Although generally chosen from films, such as polyvinyl alcohol, denaturation polyvinyl alcohol, a carboxymethyl cellulose, hydroxyethyl cellulose, a polyvinyl pyrrolidone, polyacrylic acid and its salt, starch, and gelatin, when gas barrier property is low, it must be made the film with which practical use can be presented using two or more sorts. A water soluble film is made to rival for paper, a nonwoven fabric, fiber, etc. as what has high gas barrier property and film reinforcement, and has ***** especially, or the film which processed spreading, sinking in, etc. is excellent especially as this wrapping in the water soluble film morphogenetic substance. Furthermore, although it is chosen by the class of this agricultural-chemicals constituent with which the endocyst also of the thickness of a film is carried out, and the quality of the material of an amount or a film in the range with which practical use can be presented and especially limitation is not carried out, 10 micrometers or more are 20 micrometers – about 80 micrometers at best especially desirably, for example from chemical resistance, reinforcement, etc. Although the weight of one package object of this invention is decided by the processing dose per unit area, about 200g is suitable from 1g, for example. When the large thing of this package unit is needed, in order to abolish the bias of contents, or in order [if it should leak out,] are min-hard and to stop, it is good to divide in the shape of a cel, and in the case of this agricultural-chemicals constituent that does not block the adhesive property of heat sealing like chloropicrin, it is easy if heat sealing divides.

[0007] Soil treatment may be made easy to also think the economical efficiency at the time of processing as important to coincidence, and not to limit a cylinder, a globular form, the shape especially of a square bag, etc., but to attach this package object at fixed spacing on a tape, and to carry out, although the configuration of a package object should be made the form which is easy to embed when processing in soil. Moreover, if the linear slot of fixed spacing is cut to the field which ****(ed), this agricultural-chemicals package object is put on the slot at a line and soil is covered when make this package object itself into the shape of a tape, put in this agricultural-chemicals constituent, and heat sealing etc. divides for every predetermined die length, or this agricultural-chemicals constituent of the specified quantity is made to connote for every predetermined tape-like location and it is used every ***** in the shape of a roll, processing of a soil disinfectant can be performed simple. Although what is necessary is just to decide them if needed, if the magnitude of the roll in this case, tape-like die length, etc. have 100g – good about 10kg with easy carrying, and they generally put the perforation into the heat-sealing part so that it may be easy to cut off at fixed spacing, they are convenient. In addition, since the film of ***** is weak by moisture, some are summarized, and it is necessary to pack with an wrapping material with still higher dampproofing, or to save such a package object in every one piece or the location adjusted to low humidity.

[0008]

[Example] Next, although an example and the example of a trial are shown, this inventions are not these things limited to seeing.

It heat sealed by having put into the 5cmx5cm square bag which created example 1 chloropicrin 3.0g by water-soluble paper DIZORUBO WAL (Mishima Paper Co., Ltd. make), and the fumigant package object was acquired.

[0009] It heat sealed by having put into the 5cmx5cm square bag which created example 2 chloropicrin 3.0g by water soluble film S-400CW (Japanese ** film company make), and the fumigant package object was acquired.

[0010] It put 1g of chloropicrin at a time into 10cm spacing of a long and slender bag with a width of face [of

example 3 water-soluble-film S-400CW (Japanese ** film company make)] of 2.5cm using heat sealing, and the tape-like fumigant package object was acquired.

[0011] The fumigant package object which put example 4 chloropicrin 12g into the 10cmx10cm square bag of water soluble film S-400CW (Japanese ** film company make), heat sealed, put in the line of heat sealing in the center still in every direction, and was quadrised into the character of a rice field was acquired. The adhesive property of heat sealing has manufactured easily well.

example of trial: — test condition sample offering insect: — a sweet potato root-knot nematode (SENCHUU quantity contamination soil)

Sample-offering vegetation: Tomato (form: sugar ready)

trial scale: — each division: — 2a. Hataji art: — the package object of examples 1 and 2 was 30cm spacing of front and rear, right and left, and the example 3 was embedded into soil in a depth of 10-15cm in parallel at intervals of 30cm, and carried out the douche of the chloropicrin liquids and solutions of contrast by the manual system irrigator in 30cm spacing of front and rear, right and left, and a depth of about 10cm.

[0012] search procedure: — workability evaluation: — the impression which the operator dealt with was recorded. Environment assessment: The presence person stood on the lee side of an experimental plot, and recorded stimulative etc.

The prevention effectiveness evaluation: After drugs processing, after the polyvinyl chloride film performed gas drainage for five days after covering for ten days, the tomato was transplanted, field sprinkling of water in 1 first half per day of the 1st inning was performed, and ***** extent of 27 days after was investigated on the criteria of the next table 1.

[0013]

[Table 1]

Table 1 damage characteristic : A ***** formation condition A characteristic ***** — it does not accept at all — 0 Accept ***** formation slightly. 1 ***** formation is accepted in whenever [middle]. 2 ***** formation is accepted in a large number. 3 ***** formation is accepted continuously. 4 [0014] test-result: — workability evaluation: — although it came out for examples 1-3 not to sense especially stimulative etc., but to treat by the direct hand, at the time of an injection of the drug solution to the irrigator, or the soil douche, the example of contrast has a stimulus in an eye or a nose, and needed a gas mask and safety goggles.

Environment assessment: Although examples 1-3 sensed neither a smell nor a stimulus, although the examples of contrast were few, they sensed the stimulus of a smell peculiar to chloropicrin, and an eye.

[0015] The prevention effectiveness evaluation: Average ***** extent of sample offering drugs is shown in (Table 2). Although examined by n= 4 (4 ream system), the average showed this result.

[0016]

[Table 2]

表 2	
検体	根りゅう指数
実施例 1	0. 7 5
実施例 2	1. 0
実施例 3	0. 7 5
対照例	1. 0
無処理	3. 2 5

[0017] The package objects of the soil treatment drugs obtained by this example are the drugs which can maintain the SENCHUU effectiveness over a long period of time. As mentioned above, the package object of an example did not have stimulative, the immediate wrapper object could be processed in soil that it is simple and sanitarily by hand, and the effect of this agricultural-chemicals active ingredient was maintained enough, and was very practical.

[0018]

[Effect of the Invention] By this invention, there is also no complicated actuation, drugs with stimulative were simply made into the agricultural-chemicals pharmaceutical preparation package object, facilitation of spraying, sanitary spraying, etc. were attained further, and the living thing effectiveness equivalent to the former was shown also about effect. This invention offers the package object of the fumigant which has many advantages in this way.

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(54) 【発明の名称】 農薬包装体

(57) 【要約】

【目的】 製造が簡単で土壌中の有害生物を簡便に衛生的に防除できる農薬薫蒸剤を開発すること。

【構成】 液体で保存し、ガス体で有害生物を防除する薫蒸剤を液体のまま、高ガスバリア性で水との接触でバリア性を失う性質のフィルムで包装した農薬包装体であり、本来の防除効力を損なうことなく、簡便にかつ刺激などを感じずに衛生的に取り扱うことができ、製造も容易であることを特徴とする。

【特許請求の範囲】

【請求項1】 常温揮散性を有する農薬活性成分を、水による水壊性及び高ガスバリア性を有するフィルムによって包装することを特徴とする農薬包装体

【請求項2】 常温揮散性を有する農薬活性成分を分割、内包した請求項1の農薬包装体

【請求項3】 常温揮散性を有する農薬活性成分がクロロピクリンである請求項1、2記載の農薬包装体

【請求項4】 水壊性及び高ガスバリア性を有するフィルムが紙又は不織布を使用するポリビニルアルコール製フィルムである請求項1～3記載の農薬包装体

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は、常温で揮散性のある農薬活性成分を水蒸気や水滴あるいは土壤中の水分などにより破膜あるいはピンホールができガスバリア性を失う性質（水壊性と記す）を有し、かつ高ガスバリア性を有するフィルムで包装した農薬包装体に関し、農業上の有害生物を防除するために使用される薫蒸剤（液体で保存し、ガス状で有害生物の防除効力を発揮する農業用薬剤）をより安全にかつ簡便に使用でき、より簡単に製造できるようにしたものである。

【0002】

【従来の技術】 農作物に被害を及ぼす有害生物を防除するために従来からクロロピクリン、臭化メチル、D-D剤等の土壤消毒用の薫蒸剤が多く使われている。これらの薬剤は畑を耕起し、整地する際、土壤に注入して使用するが、大気中に活性成分が逃げるのを抑えて効力を高めたり刺激臭を抑えたりするためにその上から散水して水封したり、農業用フィルムで被覆するのが一般的である。これらの薬剤は揮散性が高く、特異な刺激臭があったり毒性が強かったりするため、適性に使っても使用者や処理圃場周辺の住民に不快感を与えたり、状況によっては健康上の障害を与えかねない。また、慎重を期さなければならないなど煩雑である。これらの問題を解決するために、薫蒸剤を水溶性フィルムで包装して簡便に使用する方法は以前から紹介されている。しかし、薫蒸剤を液体のまま水溶性フィルムで包装すると、フィルムのピンホールやヒートシール部から薫蒸剤が漏れやすいため実用化されていなかった。それらを解決するため、ゲル化剤を用いて錠剤化して水溶性フィルムで包装する方法が特公昭47-1799、特公昭47-1800、特開昭62-192301、特開昭63-230602等に開示されている。しかし、これらの方法で得られたゼリー状物または固形物は軟らかく、強度がないため、輸送中などの振動によって液体に戻ったり、崩れたりする欠点がある。この欠点を補うため合成ゴムやセルロース誘導体を添加してゲル強度を保つ方法が開示されているが、ガス化しやすい活性成分が刺激性や毒性の問題を

引き起こしかねないので、その製造法はゲル化剤やゲル強度補強剤等の種々の添加剤はなるべく使わないで、極力簡単な処方では製造できる方がよい。また、水溶性フィルムに包装する際に外部に洩れたり空気中の酸素によって酸化されるのを防ぐために真空パックする方法が開示されているが（特開昭62-192301）、真空にするときガス状活性成分の一部が流出する恐れがあり、真空にしないでも問題のない製剤形態にしておいたほうがよい。一方、薫蒸剤を吸着剤に吸着させて、水溶性樹脂容器に収納する方法（特開昭56-45401）も開示されているが、経済性などのためか、実用化には至っていない。

【0003】

【発明が解決しようとする課題】 ガス化しやすい土壤消毒用活性成分を、ゲル化剤、吸油剤、合成ゴム、可燃性の有機溶剤や種々の添加剤等を使つての固形化、真空パッキングなど複雑な形態や操作などを行わないで簡単に低コストに製造できる薬剤形態にし、使用者が簡便かつ衛生的に使用でき、しかも活性成分本来の効力を十分に発揮できるようにすることが本特許の課題である。

【0004】

【課題を解決するための手段】 本発明者らは前記したような課題を満足させられる技術を鋭意研究した結果、本発明に到ったものである。即ち本発明は、液体で保存し、ガス状にして土壤中の有害生物を防除する目的の農薬活性成分（以下、該農薬活性成分と記す）をより簡単に製造し、使用者が簡便に利用できるようにした薬剤形態に関し、該農薬活性成分をゲル化剤などを用いて固形化することなく、液状のまま水壊性を有する高ガスバリア性フィルム（以下、該包装フィルムと記す）によって包装することを特徴とする包装体に関する。この包装体は畑等の土壤表面または、土壤中に所定間隔で所定量を処理し、必要に応じてシートなどで被覆すると（特に土壤表面処理の場合は必須）、慣行の液剤の灌注処理より簡便かつ衛生的に土壤中の有害生物を防除することができる。つまり、処理された包装体はその該包装フィルムが蒸気や水滴などによって穴が開き、内容物の該農薬活性成分が放出されてガス状で土壤中に拡散することにより有害生物を防除することができる。以下に本発明を具体的に説明する。本発明に使用できる該農薬活性成分は土壤中にその一生あるいは一時期を生息し、農作物等の有用植物に害を及ぼす昆虫、雑草、病害等を防除する活性を有するものであり、例えばD-D（1, 3-ジクロロプロペンと1, 2-ジクロロプロパンの混合物）、D B C P（1, 2-ジブロモ-3-3クロロプロパン）、D C I P（ジクロロジソプロピルエーテル）、M I T C（メチルイソチオシアネート）、クロロピクリン（トリクロロニトロメタン）、メチルプロマイド（プロモメタン）、ジメチルジクロロビニルホフエートなどが挙げられる。但し、本発明で用いる農薬活性成分は上記に限

定されるものではなく、液体で保存でき、ガス状で有害生物に防除活性を示すものなら全て該当し、1種類または2種類以上を併用して使用してもよい。

【0005】本発明の農薬包装体の製法は該農薬活性成分に、その活性を損なわずに薫蒸剤としての特長を効率よく発揮させるための必要最低限の有機溶剤、界面活性剤や分解防止剤等の補助剤を溶解して使用してもよく、この農薬組成物（以下、該農薬組成物と記す）を液状のまま該包装フィルムで包装することにより容易に農薬製剤包装体を得ることができる。また、本発明において薬剤を数グラム以上包装する場合は一つの包装体をヒートシールなどでセル状に分割することにより包装内での内容物の片寄りが防止でき、また、土壌表面に処理された薬剤が表面の傾斜や凹凸により局在化することが防止できるので有利である。このような形態の薬剤は特にクロルピクリン等のような刺激性のあるガスを揮散する農薬活性成分に適している。

【0006】本発明で利用できる該包装フィルムは必ずしも水に溶ける必要はないが、水壊性が必要であり、かつ、保存中に内包の該農薬組成物が液状あるいはガス状で透過したり、該農薬組成物に溶けたりしない一定の強度を持つフィルムなら何でもよく、中に入れる該農薬組成物の性質や保存や使用する状況に合わせて選択すれば良い。一般的にはポリビニルアルコール、変性ポリビニルアルコール、カルボキシメチルセルロース、ヒドロキシエチルセルロース、ポリビニルピロリドン、ポリアクリル酸およびその塩、デンプン、ゼラチン等のフィルムから選択されるが、ガスバリア性が低い場合は2種以上を利用して実用に供し得るフィルムにしなければならない。なかでも高いガスバリア性とフィルム強度を有し、水壊性を有するものとして紙、不織布、繊維等に水溶性フィルムを張り合わせたり、水溶性フィルム形成物質を塗布あるいは含浸などの処理をしたフィルムが該包装材料として特に優れている。更にフィルムの厚さも内包される該農薬組成物の種類や量あるいはフィルムの材質によって実用に供し得る範囲で選択され、特に限定はされないが、例えば耐薬品性、強度などから10 μ m以上がよく、特に望ましくは20 μ m～80 μ m程度である。本発明の1個の包装体の重量は単位面積当りの処理薬量によって決まるが、例えば1gから200g程度が適当である。この包装単位の大きいものが必要とされる場合は内容物の偏りをなくするためや、万一漏出した場合に最小にくい止めるためにセル状に分割しておくともよく、クロルピクリンのようにヒートシールの接着性を妨害しない該農薬組成物の場合はヒートシールで分割すれば簡単である。

【0007】包装体の形状は土壌中に処理する場合は埋め込みやすい形にすべきであるが、同時に加工時の経済性も重視する必要があり、円筒、球形、角袋状など特に限定せず、該包装体をテーブル上に一定間隔で取り付けて

土壌処理しやすくしてもよい。また、該包装体そのものをテープ状にして該農薬組成物を入れてヒートシールなどで所定の長さ毎に分割するか、テープ状の所定位置毎に所定量の該農薬組成物を内包せしめてロール状に巻いておき、使用するときは耕運した圃場に一定間隔の線状の溝を切り、その溝に該農薬包装体を線状に置いて土壌をかければ簡単に土壌消毒剤の処理ができる。この場合のロールの大きさ、テープ状の長さなどは必要に応じて決めればよいが、一般的には持ち運びの容易な100g～10kg程度がよく、一定間隔で切り取りやすいようにヒートシール部分にミシン目を入れておくとも便利である。尚、水壊性のフィルムは湿気に弱いのでこのような包装体は1個ずつあるいは数個まとめて更に防湿性が高い包材で包装したり、低湿度に調整された場所で保存する必要がある。

【0008】

【実施例】次に実施例と試験例を示すが、本発明はこれらのみに限定されるものではない。

実施例1

クロルピクリン3.0gを水溶紙ディゾルボWAL（三島製紙社製）で作成した5cm×5cmの角袋に入れ、ヒートシールをして薫蒸剤包装体を得た。

【0009】実施例2

クロルピクリン3.0gを水溶性フィルムS-400CW（日合フィルム社製）で作成した5cm×5cmの角袋に入れ、ヒートシールをして薫蒸剤包装体を得た。

【0010】実施例3

水溶性フィルムS-400CW（日合フィルム社製）の幅2.5cmの細長い袋の10cm間隔にヒートシールを利用してクロルピクリンを1gずつ入れ、テープ状の薫蒸剤包装体を得た。

【0011】実施例4

クロルピクリン12gを水溶性フィルムS-400CW（日合フィルム社製）の10cm×10cmの角袋に入れ、ヒートシールをして更に縦横の中央にヒートシールの線を入れて田の字に4分割した薫蒸剤包装体を得た。ヒートシールの接着性が良く簡単に製造できた。

試験例：

試験条件

供試虫：サツマイモネコブセンチュウ（センチュウ高汚染土壌）

供試植物：トマト（品種：シュガーレディー）

試験スケール：各区：2アール畑地

処理方法：実施例1、2の包装体は前後左右30cm間隔で、実施例3は30cm間隔で平行に10～15cmの深さで土壌中に埋め込み、対照のクロルピクリン液剤は手動式灌注器で前後左右30cm間隔、深さ約10cmで灌注した。

【0012】調査方法：

作業性評価：作業者の取り扱った印象を記録した。

環境評価：立ち合い者が試験区の風下に立ち、刺激性などを記録した。

防除効果評価：薬剤処理後、10日間ポリ塩化ビニルフィルムで被覆後、5日間ガス抜きを行った後、トマトを

表1

被害指数：

根りゅう形成状態	指数
根りゅう形成全く認められない	0
僅かに根りゅう形成を認める	1
中程度に根りゅう形成を認める	2
多数に根りゅう形成を認める	3
連続して根りゅう形成を認める	4

【0014】試験結果：

作業性評価：実施例1～3は刺激性などは特に感じず、直接手で扱うことができたが、対照例は灌注器への薬液の投入や土壌灌注時に目や鼻に刺激があり、防毒マスクや保護メガネを必要とした。

環境評価：実施例1～3は臭いや刺激を感じなかったが、対照例はクロルピクリン特有の臭いと目の刺激を僅かではあるが感じた。

【0015】防除効果評価：供試薬剤の平均根りゅう程度を（表2）に示す。この結果はn=4（4連制）で試験したものの平均値で示した。

【0016】

【表2】

検体	根りゅう指数
実施例1	0.75
実施例2	1.0
実施例3	0.75
対照例	1.0

【0017】本実施例で得られた土壌処理薬剤の包装体

移植し1日1回表面灌水を行い27日後の根りゅう程度を次の表1の基準で調査した。

【0013】

【表1】

は長期間にわたりセンチュウ効果を維持することができる薬剤である。以上のように実施例の包装体は刺激性がなく、直接包装体を手で簡便にかつ衛生的に土壌中に処理でき、該農薬活性成分の効力は十分維持され極めて実用的であった。

【0018】

【発明の効果】本発明によって、刺激性のある薬剤を複雑な操作もなく簡単に農薬製剤包装体にでき、更に散布の簡便化、衛生的散布等が達成され、効力についても、従来と同等の生物効果を示した。本発明はこのような多くの利点を有する蒸散剤の包装体を提供するものである。